KAREEM A. ZAGHLOUL, MD, PHD

Surgical Neurology Branch, NINDS
Building 10, Room 3D20
National Institutes of Health
10 Center Drive, Bethesda, MD 20892-1414

EDUCATION

1991-1995 BSc, Massachusetts Institute of Technology, Cambridge MA
Electrical Engineering and Computer Science

1996-1997 Fellow, American University in Cairo, Cairo Egypt
Center for Arabic Studies Abroad (CASA)

1995-2003 MD, PhD, MSc, University of Pennsylvania, Philadelphia PA
Neuroscience; Bioengineering

POST GRADUATE TRAINING

06/2003-06/2004 Intern, General Surgery, Hospital of the University of Pennsylvania
Philadelphia PA

07/2004-06/2010 Resident, Department of Neurosurgery, Hospital of the University of Pennsylvania
Philadelphia PA

07/2007-06/2008 Fellow, Stereotactic and Functional Neurosurgery, Dr. Gordon H. Baltuch
Department of Neurosurgery, Hospital of the University of Pennsylvania
Philadelphia PA

09/2010-12/2010 Fellow, Epilepsy Surgery, Dr. Johannes Schramm
Department of Neurosurgery, University of Bonn
Bonn, Germany

ACADEMIC POSITIONS

08/2010-present Staff Clinician, Surgical Neurology Branch, National Institutes of Neurological Disorders and Stroke, National Institutes of Health
Bethesda, MD

08/2010-present Adjunct Assistant Professor, Interdisciplinary Program in Neuroscience,
Georgetown University, Washington, DC

08/2010-present Adjunct Assistant Professor, Department of Neurosurgery,
Georgetown University, Washington, DC

09/2011-present Adjunct Assistant Professor, Department of Neurosurgery, University of Virginia Health Sciences Center, University of Virginia, Charlottesville, VA

01/2012-present Adjunct Assistant Professor, Neuroscience and Cognitive Science,
University of Maryland, College Park, MD

LICENSURE

Pennsylvania (Medical) MD427533

PROFESSIONAL MEMBERSHIPS

Congress of Neurological Surgeons
American Association of Neurological Surgeons
American Medical Association
Society for Neuroscience
Institute of Electrical and Electronics Engineers
Sigma Xi Research Society

PEER REVIEWED PUBLICATIONS

Zaghloul KA, Weidemann CT, Lega BC, Jaggi JL, Baltuch GH, Kahana MJ (2012) Decision conflict modulates spiking activity in the human subthalamic nucleus during action selection. *Journal of Neuroscience* 32(7): 2453-60

Schiemann J, Schlaudraff F, Klose V, Bingmer M, Seina S, Magill PJ, Zaghloul KA, Schneider G, Liss B, Roeper J (2012) K-ATP channels in dopamine neurons of the medial substantia nigra control burst firing and novelty-induced exploratory behavior *Nature Neuroscience* 15(9): 1272-80

Weintraub D, Zaghloul KA (2012) The role of the subthalamic nucleus in cognition *Reviews in the Neurosciences* In Press

Lega BC, Kahana MJ, Jaggi JL, Baltuch GH, Zaghloul KA (2011) Neuronal and oscillatory activity during reward processing in the human ventral striatum *NeuroReport* 22(16): 795-800

Zaghloul KA and Schramm J (2011) Surgical management of glioneuronal tumors with drug resistant epilepsy *Acta Neurochirurgica* 6268: 1-9

Lega BC, Serruya MD, Zaghloul KA (2011) Brain Machine Interfaces: Electophysiological Challenges and Limitations *Critical Reviews in Biomedical Engineering* 39(1): 121-144

Mehta GU, Heiss JD, Park JK, Asthagiri AR, Zaghloul KA, Lonser RR (2010) Neurological Surgery at the National Institutes of Health *World Neurosurgery* 74(1): 49-59

Zaghloul KA, Blanco JA, McGill K, Jaggi JL, Baltuch GH, Kahana MJ (2009) Human Substantia Nigra Neurons Encode Unexpected Financial Outcomes *Science* 323: 1496-99

Bauman JA, Church E, Halpern CH, Danish SF, Zaghloul KA, Jaggi JL, Stein S, Baltuch GH (2009) Subcutaneous Heparin for Prophylaxis of Venous Thromboembolism in Deep Brain Stimulation Surgery: Evidence From A Decision Analysis *Neurosurgery* 65(2): 276-80

Zaghloul KA, Heuer GG, Guttenberg MD, Shore EM, Kaplan FS, Storm PB (2008) Lumbar puncture and surgical intervention in a child with undiagnosed Fibrodysplasia Ossificans Progressiva. *Journal of Neurosurgery: Pediatrics* 1:91-94

Heuer GG, Zaghloul KA, Jaggi JL, Baltuch GH (2008) Use of an Integrated Platform System in the Placement of Deep Brain Stimulators. *Operative Neurosurgery* 1: 245-248

Heuer GG, Hardesty DA, Zaghloul KA, Simon-Schwartz EM, Foley R, Storm PB (2008) Anatomic hemispherectomy for intractable epilepsy in a patient with unilateral schizencephaly. *Journal of Neurosurgery: Pediatrics* 2(2): 146-149

Stiefel MF, Zaghloul KA, Bloom S, Gracias VH, LeRoux PD (2007) Improved cerebral oxygenation after high-dose inhaled aerosolized prostacyclin therapy for acute lung injury: A case report. *Journal of Trauma-Injury, Infection, and Critical Care* 63(5): 1155-1158

Chen HI, Heuer GG, Zaghloul KA, Simon SL, Weigele JB, Grady MS (2007) Lumbar Vertebral Hemangioma Presenting with Acute Onset of Neurological Symptoms. *Journal of Neurosurgery: Spine* 7(1): 80-85

Zaghloul KA, Manookin MB, Boahen KA, Demb JB (2007) Functional circuitry for peripheral suppression in mammalian Y-type retinal ganglion cells. *Journal of Neurophysiology* 97:4327-4340

Heuer GG, Zaghloul KA, Roberts R, Stiefel MF, Storm PB (2007) Successful Microsurgical Extraction of a Migrated Coil After Failed Endovascular Closure of a Blalock-Taussig Shunt. *Journal of Neurosurgery: Pediatrics* 106(2): 136-138

Zaghloul KA and Boahen KA (2006) A silicon retina that reproduces signals in the optic nerve. *Journal of Neural Engineering* 3: 257-267

Zaghloul KA, Boahen KA, Demb JB (2005) Contrast adaptation in subthreshold and spiking responses of mammalian Y-type retinal ganglion cells. *Journal of Neuroscience* 25(4): 860-8

Zaghloul KA and Boahen KA (2005) An On-Off log-domain filter circuit. *IEEE Transactions on Circuits and Systems* 52(1): 99-107

Zaghloul KA and Boahen KA (2004) Optic nerve signals in a neuromorphic chip I: Outer and inner retina model. *IEEE Transactions on Biomedical Engineering* 51(4): 657-666

Zaghloul KA and Boahen KA (2004) Optic nerve signals in a neuromorphic chip II: Testing and results. *IEEE Transactions on Biomedical Engineering* 51(4): 667-675

Huang, JH, Zaghloul KA, Zager EL (2004) Surgical management of brachial plexus region tumors. *Surgical Neurology* 61(4): 372-378

Zaghloul KA, Boahen KA, Demb JB (2003) Different circuits for On and Off ganglion cells cause different contrast sensitivities. *Journal of Neuroscience* 23: 2645-2654

Demb JB, Zaghloul KA, Haarsma L, Sterling P (2001) Bipolar cells contribute to nonlinear spatial summation in the brisk-transient (Y) ganglion cell in mammalian retina. *Journal of Neuroscience* 21(19): 7447-7454

Demb JB, Zaghloul KA, Sterling P (2001) Cellular basis for the response to second-order motion cues in Y retinal ganglion cells. *Neuron* 32: 711-721

BOOK CHAPTERS

Zaghloul KA and Schramm J (2012) Surgical Management of Medial Extratemporal Epilepsy in *Handbook of Clinical Neurology 3rd Edition* ed. Aminoff, M.J., Boller, F., and Swaab, D.F., Elsevier Ltd

Zaghloul KA and Boahen KA (2006) Circuit designs that model the properties of the outer and inner retina. *Visual Prosthesis: New Hope In Sight.* ed. Tombran-Tink, J. and Barnstable, C., Humana Press

Zaghloul KA (2001) *A Silicon Implementation of a Novel Model for Retinal Processing.* Doctoral dissertation, Department of Neuroscience, University of Pennsylvania, Philadelphia, PA

CONFERENCE PODIUM PRESENTATIONS

Zaghloul KA (2012) Chronic Intracranial Monitoring for Seizure Localization: Clinical Considerations and Scientific Implications. *Congress of Neurological Surgeons Annual Meeting*, Chicago, IL

Zaghloul KA (2012) Neuronal activity in the human subthalamic nucleus encodes decision conflict during action selection. *American Society for Stereotactic and Functional Neurosurgery*, San Francisco, CA

Zaghloul KA, Lega BC, Weidemann CT, Jaggi JL, Baltuch GH, Kahana MJ (2011) Decision Conflict Modulates Spiking and Oscillatory Activity in the Human Subthalamic Nucleus During Action Selection. *Congress of Neurological Surgeons Annual Meeting*, Washington, DC

Zaghloul KA (2011) Chronic Intracranial Monitoring for Seizure Localization: Clinical Considerations and Scientific Implications. *Congress of Neurological Surgeons Annual Meeting*, Washington, DC

Zaghloul KA, Burke JF, Jacobs J, Kahana MJ (2011) Alterations in Gamma Network Topology during a Free Recall Memory Task. *American Association for Neurological Surgeons* Annual Meeting, Denver, CO

Zaghloul KA, Burke JF, Jacobs J, Kahana MJ (2009) Differential theta and gamma coherence associated with successful memory encoding. *Society for Neuroscience Annual Meeting*, Chicago, IL

Zaghloul KA, Burke JF, Jacobs J, Manning J, Litt B, Kahana MJ, Baltuch GH (2009) Intracranial EEG for Neuronal Oscillatory Contingency During Cognitive Tasks, *American Association for Neurological Surgeons Annual Meeting*, San Diego, CA

Zaghloul KA, Blanco JA, McGill K, Jaggi JL, Baltuch GH, Kahana MJ (2008) Human Substantia Nigra Encodes Unexpected Outcome. *Society for Neuroscience Annual Meeting*, Washington, DC

Bauman JA, Church E, Halpern CH, Danish SF, Zaghloul KA, Jaggi JL, Stein S, Baltuch GH (2008) Subcutaneous Heparin for Prophylaxis of Venous Thromboembolism in Deep Brain Stimulation Surgery: Evidence From A Decision Analysis. *American Society of Stereotactic and Functional Neurosurgery Meeting*, Vancouver, BC, Canada

Zaghloul KA, Blanco JA, McGill K, Jaggi JL, Baltuch GH, Kahana MJ (2008) Reinforcement Learning in the Basal Ganglia during Deep Brain Stimulation. *American Society of Stereotactic and Functional Neurosurgery Meeting*, Vancouver, BC, Canada

Zaghloul KA, Blanco JA, McGill K, Jaggi JL, Baltuch GH, Kahana MJ (2008) Reinforcement Learning in the Basal Ganglia during Deep Brain Stimulation. *American Association of Neurological Surgeons Annual Meeting*, Chicago, IL

Zaghloul KA, Blanco JA, McGill K, Jaggi JL, Baltuch GH, Kahana MJ (2007) Reinforcement Learning in the Basal Ganglia during Deep Brain Stimulation. *19th Pan Philadelphia Neurosurgery Conference*, Philadelphia, PA

INVITED TALKS

Zaghloul KA (2012) Exploring the neural correlates of cognitive function through neurosurgery, NINDS Advisory Council, National Institutes of Health, Bethesda, MD

Zaghloul KA and Lungu C (2012) Parkinson's Disease: From Genetics to Surgery, Demystifying Medicine Seminar, National Institutes of Health, Bethesda, MD

Zaghloul KA (2011) Exploring the neural correlates of human decision and memory through neurosurgery. Visiting Professor, Department of Neurosurgery, University of Iowa, Iowa City, IA

Zaghloul KA (2011) Exploring the neural correlates of human decision and memory through neurosurgery. NINDS Grand Rounds, National Institutes of Health, Bethesda, MD

Zaghloul KA (2011) Functional Neurosurgery: Communicating directly with the human brain. Army Research Laboratory, Adelphi, MD

Zaghloul KA (2011) Neural correlates of decision and memory in human neurosurgical patients. Department of Neuroscience, Georgetown University, Washington, DC

Zaghloul KA (2011) Functional neurosurgery, epilepsy, and human neurophysiology. Clinical Research Training Program, National Institutes of Health, Bethesda, MD

Zaghloul KA (2010) The neural correlates of cognitive function. NINDS Grand Rounds, National Institutes of Health, Bethesda, MD

Zaghloul KA (2010) Neuromodulation and neuroeconomics. Department of Psychology, University of Pennsylvania, Philadelphia, PA

Zaghloul KA (2009) Financial rewards in the human basal ganglia. Department of Psychology, University of Pennsylvania, Philadelphia PA

Zaghloul KA (2009) Future directions in neurosurgery: DBS surgery and neuromodulation. Wharton Business School, University of Pennsylvania, Philadelphia, PA

PREVIOUS GRANT SUPPORT

01/2010-12/2014 NIH K99/R00 Pathways to Independence (K99NS067241)
Reinforcement Learning in the Basal Ganglia
Role: Principal investigator
Mentor: Michael Kahana
To use deep brain stimulation surgery as a platform for exploring the neural correlates of cognitive function in basal ganglia structures

01/2010-12/2012 NIH R21 Exploratory/Developmental Research NINDS (R21NS067316)
Intracranial EEG for Neuronal Oscillatory Contingency during Cognitive Tasks
Role: Co-investigator
Principal investigator: Michael Kahana
Developed and principally wrote proposal to develop a real-time feedback system conditioning cognitive stimulation on the presence of neuronal oscillations recorded from intracranial electroencephalogram (iEEG) signals

12/2007-11/2010 Dana Foundation Grant
Intracranial EEG for Theta Rhythm Contingency During Cognitive Tasks
Role: Key personnel
Principal Investigator: Michael Kahana
Developed and principally wrote proposal to develop a real-time feedback system for a dynamic brain machine interface

REVIEWER

IEEE Transactions on Biomedical Engineering
Nature Methods
Journal of Semiconductor Technology and Science
Brain
Grant Reviewer – NFL Charities
Neurosurgery

TEACHING

Georgetown University Medical Neuroscience Course